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terminals to audio-visual databases**

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## Foreword

This final draft European Telecommunication Standard (ETS) has been produced by the Terminal Equipment (TE) Technical Committee of the European Telecommunications Standards Institute (ETSI), and is now submitted for the Voting phase of the ETSI standards approval procedure.

<b>Proposed transposition dates</b>	
Date of latest announcement of this ETS (doa):	3 months after ETSI publication
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Date of withdrawal of any conflicting National Standard (dow):	6 months after doa

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## 1 Scope

This European Telecommunication Standard (ETS) specifies how narrowband (Integrated Services Digital Network (ISDN) or Public Switched Telephony Network (PSTN)) videophony terminals without data-facility can access interactive audio-visual retrieval services. To control the retrieval process, the terminal should support some interactive protocol between the end user and the service centre. For ISDN videophony terminals, the solutions using inband signalling via Dual Tone Multi Frequency (DTMF), CCITT Recommendation Q.23 [1] in the audio stream and the use of transmitting Single Byte Extension (SBE) control and indication messages (ETS 300 144 [5]) are specified in this ETS. In the case of the PSTN, use of transmitting UserInputIndication (UII) via ITU-T Recommendation H.245 [23] messages in the control channel is specified. In I-ETS 300 837 [4], this user input is not considered as data capability.

The use of DTMF, SBE and UII enables a user to control the retrieval process via input of alphanumeric characters from a keypad or keyboard, equivalent to the DTMF signals used in analogue telephony. This may be used to manually operate remote equipment such as voice mail or video mail systems, menu-driven information services etc. DTMF, SBE and UII support at least, the transmission of user input characters '0-9', '\*', and '#'. Transmission of other characters is optional. The use of DTMF, SBE or UII as interactive protocols is very simple, since the service centre can instruct the user, either in text or spoken, in the same way as in voice response systems.

For Personal Computer (PC) / Work station (WS) based ISDN and PSTN videophony terminals, an additional selection mechanism that permits pointing device selections via (push) buttons in the video presentation area using SBE or UII messages is specified.

This ETS is applicable to audio-visual services based on retrieval of information, coded according to ETS 300 145 [2] (in the ISDN case) or I-ETS 300 837 [4] (in the PSTN case). In this ETS the definition "videophony" is used to address both videotelephony and videoconferencing applications.

The audio-visual retrieval services will be hosted on an audio-visual service centre. In this ETS only the audio-visual database functionality of the service centre will be specified.

NOTE: Information retrieval using videophony terminals in combination with DTMF or SBE/UII, are only two of the possible scenarios for the access of retrieval services and audio-visual services on narrowband networks. In ETR 176 and ETR 272 (see annex A) other scenarios have been described.

## 2 Normative references

This ETS incorporates by dated or undated reference, provisions from other publications. These references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this ETS only when incorporated in it by amendment or revision. For undated references the latest edition of the application referred to applies.

[1] CCITT Recommendation Q.23 (1990): "Signalling frequencies for push-button telephone sETS and reception of those signals in exchanges".

[2] ETS 300 145 (1996): "Integrated Services Digital Network (ISDN); Audiovisual services Videotelephone systems and terminal equipment operating on one or two 64 kbit/s channels".

NOTE 1: ETS 300 145 is the ETSI equivalent to ITU-T Recommendation H.320 [3]. The scope of ETS 300 145 is restricted to 1B and 2B ISDN videophones.

[3] ITU-T Recommendation H.320 (1993): "Narrow-band visual telephone systems and terminal equipment".

[4] pri-ETS 300 837: "Public Switched Telephone Network (PSTN); Terminals for low bitrate Multimedia communication".

NOTE 2: pri-ETS 300 837 is the ETSI equivalent to ITU-T Recommendation H.324 [18].

[5] ETS 300 144 (1996): "Integrated Services Digital Network (ISDN); Audiovisual services; Frame structure for a 64 kbit/s to 1 920 kbit/s channel and associated syntax for inband signalling".

NOTE 3: ETS 300 144 is the ETSI equivalent to ITU-T Recommendations H.221 [6] and H.242 [12].

[6] ITU-T Recommendation H.221 (1995): "Frame structure for a 64 to 1 920 kbit/s channel in audiovisual services".

[7] ITU-T Recommendation H.230 (1995): "Frame-synchronous control and indication signals for audiovisual systems".

[8] ITU-T Recommendation H.223 (1996): "Multiplexing protocol for low-bitrate multimedia communication".

[9] CCITT Recommendation B.13 (Blue Book Fasc. I.3 1991): I.3: "Terms and definitions".

[10] ITU-T Recommendation F.300 (1994): "Videotex service".

[11] ETS 300 143 (1994) and A1: "Integrated Services Digital Network (ISDN); Audiovisual services; Inband signalling procedures for audiovisual terminals using digital channels up to 2 048 kbit/s".

NOTE 4: ETS 300 143 is the ETSI equivalent to ITU-T Recommendation H.242 [12].

[12] ITU-T Recommendation H.242 (1993): "System for establishing communication between audiovisual terminals using digital channels up to 2 Mbit/s".

[13] ETS 300 142 (1995): "Integrated Services Digital Network (ISDN) and other digital telecommunications networks; Line transmission of non-telephone signals; Video codec for audio visual services at  $p \times 64$  kbits [ITU-T Recommendation H.261 (1993), modified]".

NOTE 5: ETS 300 142 is the ETSI equivalent to ITU-T Recommendation H.261 [14].

[14] ITU-T Recommendation H.261 (1993): "Video codec for audiovisual services at  $p \times 64$  kbps".

[15] CCITT Recommendation G.711 (1990): "Pulse code modulation (PCM) of voice frequencies".

[16] CCITT Recommendation G.722 (1990): "7 kHz audio-coding within 64 kbit/s".

[17] CCITT Recommendation G.728 (1992): "Coding of speech at 16 kbit/s using low-delay code excited linear prediction".

[18] ITU-T Recommendation H.324 (1996): "Terminal for low bitrate multimedia communication".

[19] I-ETS 300 380 (1995): "Universal Personal Telecommunications (UPT); Access devices Dual Tone Multi Frequency (DTMF) sender for acoustic coupling to the microphone of a handset telephone".

[20] ITU-T Recommendation V.34 (1994): "A modem operating at data signalling rates of up to 28 800 bit/s for use on the GSTN and on leased point-to-point 2-wire telephone-type circuits".

[21] ITU-T Recommendation G.723.1 (1996): "Dual rate speech coder for multimedia communication transmitting at 5,3 and 6,3 kbit/s".



- [22] ITU-T Recommendation H.263 (1996): "Videocoding for low bit rate communication".
- [23] ITU-T Recommendation H.245 (1996): "Control protocol for multimedia communication".
- [24] ITU-T Recommendation V.8 (1994): "Procedures for starting sessions of data transmission over the GSTN".
- [25] ITU-T Recommendation V.8bis (1996): "Procedures for the identification and selection of common modes of operation between data circuit terminating equipment (DCE) and between data terminal equipment (DTE) over the general switched telephone network and on leased point-to-point telephone-type circuits".
- [26] ITU-T Recommendation V.25ter (1995): "Serial asynchronous automatic dialling and control".
- [27] CCITT Recommendation T.61: "International Alphabet No. 5".

### 3 Definitions and abbreviations

#### 3.1 Definitions

For the purposes of this ETS, the following definitions apply:

**audio-visual retrieval service:** An interactive service which provides uni-directional communication by means of real-time (no store-and-forward) end-to-end audio-visual information transfer from an audio-visual database to the user (see also retrieval service).

**ISDN audio-visual database:** An information database that contains audio-visual information coded according to ETS 300 145 [2]. In the scope of this ETS it implies that the database is least capable of sending audio and video in a framed structure (ETS 300 144 [5]).

**ISDN videophony terminal:** A videophony terminal equipment that conforms to the methods described in ETS 300 145 [2]. In the scope of this ETS it implies that the terminal is at least capable of receiving audio and video sent in a framed structure (ETS 300 144 [5]). The terminal also may support data capabilities.

**interactive protocol:** A formal statement of the procedures that are adopted to ensure interactive communication between a terminal and a service centre within the application layer function (definition derived from protocol definition in ITU-T Recommendation F.300 [10]).

**PSTN audio-visual database:** An information database that contains audio-visual information coded according to I-ETS 300 837 [4]. In the scope of this ETS it implies that the database is least capable of sending audio and video in packet mode structure (ITU-T Recommendation H.223 [8]).

**PSTN videophony terminal:** A videophony terminal equipment that conforms to the methods described in I-ETS 300 837 [4]. In the scope of this ETS it implies that the terminal is at least capable of receiving audio and video send in packed mode (ITU-T Recommendation H.223 [8]). The terminal also may support data capabilities.

**retrieval service:** An interactive service which provides the capability of accessing information stored in databases. The information will be sent to the user on demand only. The information can be retrieved on an individual basis, i.e., the time at which an information sequence is to start is under the control of the user (CCITT Recommendation B.13 [9]).

**service centre:** A computer system used by a service provider to authorize access to a service. Other functions of the service centre may include assistance to users in selecting the particular application required (either provided by the service centre or by other host computers), as well as management facilities such as billing, statistics gathering, etc. The same computer may also be a host computer and/or provide a gateway function (definition derived from ITU-T Recommendation F.300 [10]).

**videophony:** Videotelephony and/or videoconferencing are addressed in this definition.

### 3.2 Abbreviations

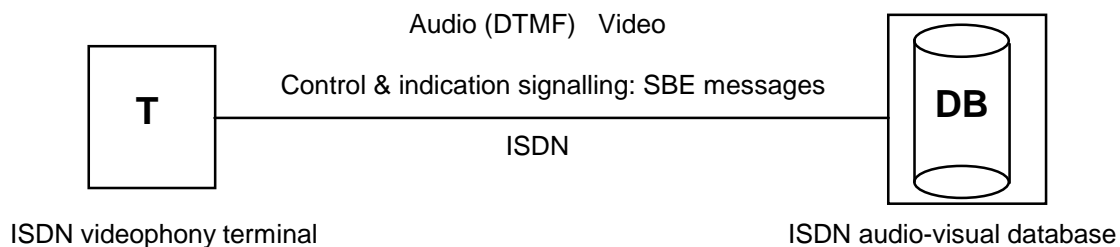
For the purposes of this ETS, the following abbreviations apply:

BAS	Bit-rate Allocation Signal
CIF	Common Intermediate Format
DCE	Data Circuit terminating Equipment
DTE	Data Terminal Equipment
DTMF	Dual Tone Multi Frequency
GSTN	General Switched Telephone Network
ISDN	Integrated Services Digital Network
PC	Personal Computer
PSTN	Public Switched Telephone Network
QCIF	Quarter Common Intermediate Format
SQCIF	Sub-QCIF
SBE	Single Byte Extension
T	Terminal
UII	UserInputIndication
WS	Work Station

## 4 Access for ISDN videophony terminals without data-facility to audio-visual retrieval services using DTMF or SBE messages

### 4.1 Description

This subclause specifies how ISDN videophony terminals without data-facility can access interactive audio-visual retrieval services. Both using inband signalling via DTMF CCITT Recommendation Q.23 [1] in the audio stream and the use of transmitting SBE control and indication signalling messages (ETS 300 144 [5]) are specified as interactive protocols.



**Figure 1: ISDN videophony terminal with access to an ISDN audio-visual database, using DTMF or SBE as interactive protocols**

### 4.2 ISDN videophony

Both ISDN videophony terminal equipment and the ISDN audio-visual database need to conform to the methods described in ETS 300 145 [2], but do not necessarily need to offer data capabilities. In the scope of this ETS it implies that the terminal is at least capable of receiving audio and video sent in a framed structure (ETS 300 144 [5]). Also that the database is at least capable of sending audio and video in a framed structure (ETS 300 144 [5]).

The call set-up procedures described in ETS 300 143 [11] and ETS 300 145 [2] for call set-up between terminals is also used for call set-up between a terminal and an audio-visual database. In general, the terminal will be the call initiator, although an audio-visual database might set-up a call.

A problem area is the number of combinations that are possible for dividing the bandwidth between video and audio, and the number of options for encoding the audio-visual information. Combination of the above options leads to a large number of communication modes. ISDN videophony terminals support different modes and not all modes are common between all vendors (or terminal types).

Therefore, in this ETS one basic communication mode is specified to guarantee interoperability. This communication mode is mandatory for both the terminal and the database. Furthermore, one preferred communication mode is specified. The preferred communication mode gives an optimal balance between interoperability (most common communication mode) and service quality (optimal video quality). It is an optional capability for the terminal and mandatory capability for the database. Other possible communication modes are specified, without expressing a preference.

Since the established communication mode will depend on the capabilities of both the terminal and the audio-visual database, a specification is given in separate clauses of this ETS for both the terminal requirements and the audio-visual database requirements.

#### 4.2.1 Basic communication mode

The basic communication mode for ISDN audio-visual retrieval services shall be:

- ISDN: 2 B-channels ( $2 \times 64$  kbits/s);
- audio: using CCITT Recommendation G.711 [15] (A-law) at 56 kbits/s;
- video: using ETS 300 142 [13] in Quarter Common Intermediate Format (QCIF) mode with a frame rate of 7,5 frames per second.

NOTE: This is a subset of  $b_1$  communication mode of ETS 300 145 [2], using CCITT Recommendation G.711 [15] (A-law) audiocoding, and videocoding in QCIF mode with a frame rate of 7,5 frames per second.

#### 4.2.2 Preferred communication mode

For ISDN audio-visual retrieval services the preferred communication mode is:

- ISDN: 2 B-channels ( $2 \times 64$  kbits/s);
- audio: using CCITT Recommendation G.711 [15] (A-law) at 56 kbits/s;
- video: using ETS 300 142 [13] in Common Intermediate Format (CIF) mode with a frame rate of 7,5 frames per second.

NOTE: This is a subset of  $b_1$  communication mode of ETS 300 145 [2], using CCITT Recommendation G.711 [15] (A-law) audiocoding, and videocoding in CIF mode with a frame rate of 7,5 frames per second.

#### 4.2.3 Other communication modes

Other possible communication modes for ISDN audio-visual retrieval services are all other combinations of:

- ISDN:
  - a) 1 B-channel ( $1 \times 64$  kbits/s);
  - b) 2 B-channels ( $2 \times 64$  kbits/s);
  - c) 6 B-channels ( $6 \times 64$  kbits/s).

NOTE: Interworking with restricted networks (e.g. switched 56 at 56 kbits/s) may be supported also.

- audio:
  - a) using CCITT Recommendation G.711 [15] (A-law or  $\mu$ -law) at 56 kbits/s;
  - b) using CCITT Recommendation G.722 [16] at 48 or 56 kbits/s;
  - c) using CCITT Recommendation G.728 [17] at 16 kbits/s;
  - d) using ITU-T Recommendation G.723.1 [21] at 5,3 or 6,3 kbits/s.
- video:
  - a) Using ETS 300 142 [13] in QCIF or CIF mode with a frame rate of 7,5, 10, 15 or 30 frames per second;
  - b) using ITU-T Recommendation H.263 [22] in SQCIF, QCIF, CIF, 4CIF or 16CIF mode.

#### 4.2.4 ISDN videophony terminal communication mode requirements

An ISDN videophony terminal shall support the basic communication mode. All other communication modes are optional for a terminal, although from a service quality viewpoint (optimal video quality) it is recommended to use the preferred communication mode.

#### 4.2.5 ISDN audio-visual database communication mode requirements

An ISDN audio-visual database shall at least support:

- the basic communication mode;
- the preferred communication mode;
- 1-B channel communication using ITU-T Recommendations G.728 [17] or G.723.1 [21] in combination with ETS 300 142 [13] in QCIF mode with a frame rate of 7,5 frames per second;
- 6-B channel communication using CCITT Recommendation G.711 [15] at 56 kbits/s and ETS 300 142 [13] in CIF mode with a frame rate of 30 frames per second.

The other communication modes are optional for an ISDN audio-visual database.

#### 4.2.6 Establishment of common communication modes

In ISDN videophony the sending terminal instructs its codec to encode the audio/video information according to the receiving capabilities of the other terminal. For audio-visual information retrieval services this implies that the terminal informs the audio-visual database about its receiving capabilities. The audio-visual database shall at least be able to provide information using the basic communication mode and the preferred communication mode. If the preferred communication mode is also commonly available, the audio-visual database shall transmit the information in this preferred communication mode.

If also other communication modes are commonly available, the audio-visual database will determine whether the preferred communication mode or an optional communication mode will be used. This determination has to be based on the required service criteria such as optimization of audio, video or bandwidth.

NOTE: The availability of more communication modes might require multiple storage of the information (in multiple communication modes), or an on-line re-encoding mechanism in the audio-visual database.

### 4.3 ISDN Interactive protocols

To control the retrieval process, the ISDN videophony terminal should support some interactive protocol between the end user and the audio-visual database. In this ETS the solutions using DTMF (CCITT Recommendation Q.23 [1]) in the audio stream and the use of transmitting SBE control and indication messages (ETS 300 144 [5]) are specified.

#### 4.3.1 DTMF as an ISDN interactive protocol

DTMF (CCITT Recommendation Q.23 [1]) specifies the possibility to transmit the characters '0-9', '\*', '#', and 'A-D'. ISDN videophony terminals shall support the transmission of '0-9', '\*', '#', to control the retrieval process. Using this interactive protocol, a user can select options from menu-driven information services by typing numeric characters from a keypad or keyboard. It is very simple to use, since the service centre can instruct the user, either in text or speech, in the same way as in voice response systems.

NOTE 1: Eventually, pointing device data on a Personal Computer/Work Station (PC/WS) could also be transferred using DTMF. However, using SBE messages is the preferred method to implement this.

NOTE 2: Although DTMF (CCITT Recommendation Q.23 [1]) signals are usually generated electrically, acoustical coupling of a DTMF device to the microphone of a handset is another option. It should however be pointed out that when using this option the electrical level to the network will depend on the characteristics of the telephone set to which it is acoustically coupled. Annex B to I-ETS 300 380 [19] indicates the variation level that could be expected.

#### 4.3.2 SBE messages as an ISDN interactive protocol:

Another option for an ISDN videophony terminal to control an audio-visual retrieval service is the use of transmitting SBE control and indication messages.

As described in paragraph 10.2.5 of (ETS 300 144 [5]) SBE control and indication messages enable the transport of alphanumeric characters. The escape code (111)[20] gives access to a table of "SBE characters" coded as the Alphabet defined in figure 2 of CCITT Recommendation T.61 [27], except columns 14 and 15. As described in paragraph 2.2.1. of ITU-T Recommendation H.230 [7], using this method each user input character is transmitted in one (1) SBE message string, which consists of two consecutive Bit-rate allocation signal (BAS) codes. In the first the code (111)[20] is transmitted, in the second the code which is equivalent to the chosen alphanumeric character is being sent.

Using this interactive protocol a user can select options from menu-driven information services by typing (alpha)numeric characters from a keypad or keyboard.

For PC/WS based terminals, an additional selection mechanism that permits pointing device selections via (push) buttons in the video presentation area, should be implemented using the specified SBE message: **PointingDeviceEventStatus**.

This **PointingDeviceEventStatus** string shall be sent after each pointing device button event (push down, release off or double-click on one of the pointing device buttons) that occurs whenever the pointing device position is within a video presentation area. The **PointingDeviceEventStatus** string will indicate the pointing device position in the video presentation area, the video channel number and the type of pointing device button event:

- Horizontal pointing device position (**XRel**);
- Vertical pointing device position (**YRel**);
- **PointingDeviceButtonEventIdentifier**.

The origin reference point to position an object within the video presentation area is always the upper left corner of the video presentation area as presented in figure 2.

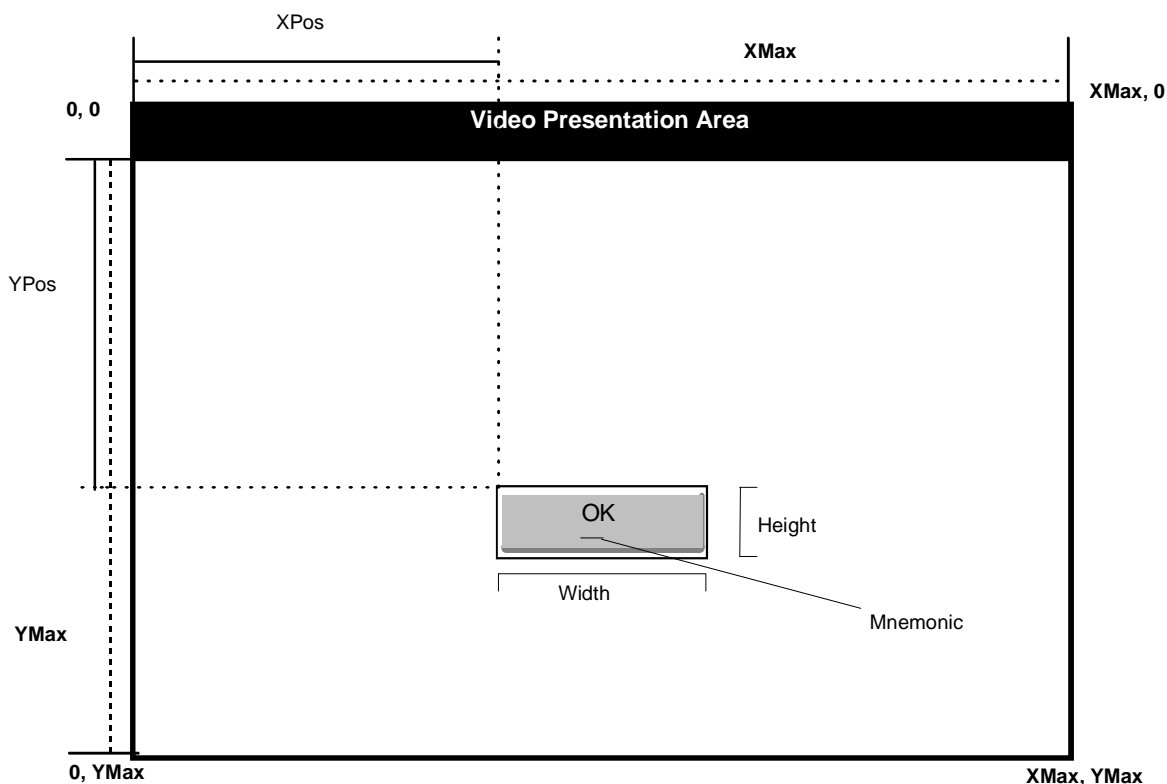


Figure 2: Positioning system for (push) buttons in video presentation area

**XRel** (0000....9999) is defined as a 4 digit integer defined as  $Integer\left(\frac{XPos}{XMax} * 9999\right)$

NOTE 1: It is noted that with the method of SBE characters using escape code (111)[20] this integer corresponds to 4 consecutive SBE numeric *characters*. The alternative of using SBE *numbers* using escape code (111)[19] is *not* used since this is limited to values between 0 and 223.

**YRel** (0000....9999) is defined as a 4 digit integer defined as  $Integer\left(\frac{YPos}{YMax} * 9999\right)$

The **PointingDeviceButtonEventIdentifier** (00....99) is a 2 digit integer indicating the specific pointing device button events as specified in table 1.

**Table 1: PointingDeviceButtonEventIdentifier descriptions**

PointingDeviceButtonEventIdentifier	Description
00	Double click on the left pointing device button
01	Left pointing device button is pushed down
02	Left pointing device button is released (up)
10	Double click on the middle pointing device button
11	Middle pointing device button is pushed down
12	Middle pointing device button is released (up)
20	Double click on the right pointing device button
21	Right pointing device button is pushed down
22	Right pointing device button is released (up)
other attributes are for further study	
NOTE 1: Double click, implies that the button is pressed twice with a locally determined time interval that constitutes a double click.	
NOTE 2: Service centres should be aware that not all PC/WS based terminals support three button pointing devices. To obtain optimal interoperability, it is advised to use the middle button of the pointing device only as an add-on functionality.	

The **PointingDeviceEventStatus** message shall be send in one (1) string of 18 consecutive SBE characters (consisting of 36 consecutive BAS codes), using the format:

- \*#XRel\*#YRel\*# PointingDeviceButtonEventIdentifier\*#;

EXAMPLE: \*#0010\*#0100\*#00\*#.

NOTE 2: The method of using multiple SBE symbols is described in paragraph 2.2.2. of ITU-T Recommendation H.230 [7].

#### 4.3.3 Support of ISDN interactive protocols

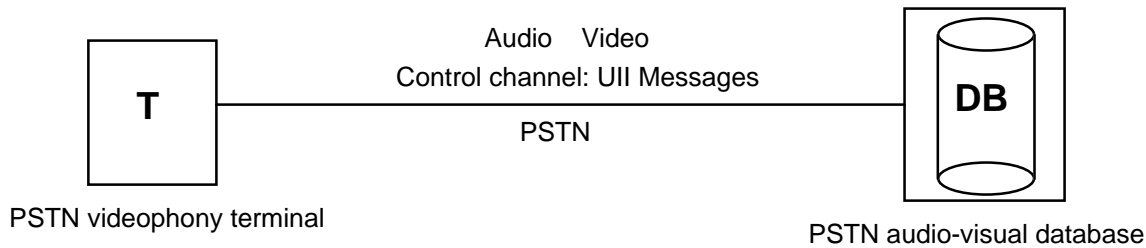
ISDN videophony terminals shall at least support the use of DTMF as an interactive protocol. For ISDN audio-visual databases the use of DTMF and SBE (including SBE **PointingDeviceEventStatus** messages) is mandatory.

In the case that the terminal is capable of sending both DTMF and SBE, SBE shall be used.

## 5 Access for PSTN videophony terminals without-data facility to audio-visual retrieval services using UserInputIndication (UII) messages

### 5.1 Description

This subclauses specifies how PSTN videophony terminals without data-facility can access interactive audio-visual retrieval services, using inband signalling via UserInputIndication (UII) ITU-T Recommendation H.245 [23] messages in the control channel as the interactive protocol.



**Figure 3: PSTN videophony terminal with access to a PSTN audio-visual database, using UserInputIndication messages as interactive protocol**

## 5.2 PSTN videophony

Both PSTN videophony terminal equipment and the PSTN audio-visual database need to conform to the methods described in I-ETS 300 837 [4], but do not necessarily need to offer data capabilities. In the scope of this ETS it implies that the terminal is at least capable of receiving audio and video sent in packet mode (ITU-T Recommendation H. 223 [8]). Also that the database is at least capable of sending audio and video in packet mode structure (ITU-T Recommendation H.223 [8]).

The call-set-up procedures described in I-ETS 300 837 [4] for call-set-up between terminals is also used for call-set-up between a terminal and an audio-visual database. In general, the terminal will be the call initiator, although an audio-visual database might set-up a call.

Therefore, in this ETS one basic communication mode is specified to guarantee interoperability. This communication mode is mandatory for both the terminal and the database. Furthermore, one preferred communication mode is specified. This preferred communication mode gives an optimal balance between interoperability (most common communication mode) and service quality (optimal video quality). It is an optional capability for the terminal and mandatory for the database. Finally, other possible communication modes are specified, without expressing a preference.

Since the established communication mode will depend on the capabilities of both the terminal and the audio-visual database, a specification is given in separate subclauses of this ETS for both the terminal requirements and the audio-visual database requirements.

### 5.2.1 Basic communication mode

The basic communication mode for PSTN audio-visual retrieval services shall be:

- PSTN: using ITU-T Recommendations V.34 [20] and V.8 [24];
- audio: using ITU-T Recommendation G.723.1 [21] at 5,3 kbits/s;
- video: using ITU-T Recommendation H.263 [22] in QCIF mode.

**NOTE:** In I-ETS 300 837 [4] the functional requirements for the use of modems for PSTN Videophony terminals is specified using the following text:

"Modems used for I-ETS 300 837 [4] terminals shall operate in full duplex, synchronous mode and conform to ITU-T Recommendation V.34 [20] and ITU-T Recommendation V.8 [24]. Support of ITU-T Recommendation V.8bis [25] is optional. The output of the ITU-T Recommendation H.223 [8] multiplexer shall be applied directly to the ITU-T Recommendation V.34 [20] synchronous data pump. When an external, non-integrated ITU-T Recommendation V.34 [20] modem is used, control between the modem and the terminal shall be via ITU-T Recommendation V.25ter [26]. In such cases the physical interface is implementation specific. The use of the optional ITU-T Recommendation V.34 [20] auxiliary channel is reserved for further study".

### 5.2.2 Preferred communication mode

For PSTN audio-visual retrieval services the preferred communication mode is:



- PSTN: using ITU-T Recommendations V.34 [20] and V.8 [24];
- audio: using ITU-T Recommendation G.723.1 [21] at 5,3 kbits/s;
- video: using ITU-T Recommendation H.263 [22] in CIF mode.

### 5.2.3 Other communication modes

Other possible communication modes for PSTN audio-visual retrieval services are all other combinations of:

- PSTN:
  - a) using ITU-T Recommendations V.34 [20] and V.8 [24].
- audio:
  - a) using ITU-T Recommendation G.723.1 [21] at 5,3 or 6,3 kbits/s.
- video:
  - a) using ITU-T Recommendation H.263 [22] in SQCIF, QCIF, CIF, 4CIF or 16CIF mode;
  - b) using ITU-T Recommendation H.261 [14] in QCIF or CIF mode.

### 5.2.4 PSTN videophony terminal communication mode requirements

A PSTN videophony terminal shall support the basic communication mode. All other communication modes are optional for a terminal, although from a service quality viewpoint (optimal video quality) it is recommended to use the preferred communication mode.

### 5.2.5 PSTN audio-visual database communication mode requirements

A PSTN audio-visual database shall at least support:

- the basic communication mode;
- the preferred communication mode.

The other communication modes are optional for a PSTN audio-visual database.

### 5.2.6 Establishment of common communication modes

In PSTN videophony the sending terminal instructs its codec to encode the audio/video information according to the receiving capabilities of the other terminal. For audio-visual information retrieval services this implies that the terminal informs the audio-visual database about its receiving capabilities. The audio-visual database shall at least be able to provide information using the basic communication mode and the preferred communication mode. If the preferred communication mode is also commonly available, the audio-visual database shall transmit the information in the preferred communication mode.

If also other communication modes are commonly available, the audio-visual database will determine whether the preferred communication mode or an optional communication mode will be used. This determination has to be based on the required service criteria like optimization of audio, video or bandwidth.

NOTE: The availability of more communication modes might require multiple storage of the information (in multiple communication modes), or an on-line re-encoding mechanism in the audio-visual database.

## 5.3 PSTN Interactive protocol: UserInputIndication (UII)

To control the retrieval process, the PSTN videophony terminal should support some interactive protocol between the end user and the service centre. In this ETS the solution of transmitting UserInputIndication (UII) via ITU-T Recommendation H.245 [23] messages in the control channel is specified.

NOTE: DTMF would also have been a candidate in the case of PSTN videophony terminals. However, it is not mandatory to transparently transport DTMF (CCITT Recommendation Q.23 [1]) by the ITU-T Recommendation G.723.1 [21] audio-codec which is used in PSTN videophony. Therefore, in this ETS the solution of transmitting UII messages is specified.

The control channel indication `UserInputIndication`, is available for transport of user input alphanumeric characters from a keypad or keyboard, equivalent to the DTMF signals. PSTN videophony terminals according to I-ETS 300 837 [4] shall support the transmission of user input characters '0-9', '\*', and '#'. Transmission of other characters is optional.

Using this interactive protocol a user can select options from menu-driven information services by typing numeric characters from a keypad or keyboard. Each user input shall be sent in one UUI message string.

For PC/WS based terminals, an additional selection mechanism that permits pointing device selections via (push) buttons in the video presentation area, shall be implemented using the specified UUI message: **PointingDeviceEventStatus**.

This **PointingDeviceEventStatus** string shall be sent after each pointing device button event (push down, release off or double-click on one of the pointing device buttons) that occurs whenever the pointing device position is within a video presentation area. The **PointingDeviceEventStatus** string will indicate the pointing device position in the video presentation area, the video channel number and the type of pointing device button event:

- horizontal pointing device position (**XRel**);
- vertical pointing device position (**YRel**);
- **VideoChannelNumber**;
- **PointingDeviceButtonEventIdentifier**.

**XRel**, **YRel** and **PointingDeviceButtonEventIdentifier** are specified as described in subclause 4.3.2.

The origin reference point to position an object within the video presentation area is always the upper left corner of the video presentation area as presented in figure 2.

The **VideoChannelNumber** (00000....65535) is a 5 digit integer indicating the LogicalChannelNumber as specified in ITU-T Recommendation H.245 [23].

The **PointingDeviceEventStatus** message shall be sent in one UUI message string of 25 characters, using the format:

- `*#XRel*#YRel*# VideoChannelNumber*# PointingDeviceButtonEventIdentifier*#;`

EXAMPLE: `*#0010*#0100*#00001*#00*#.`

## **Annex A (informative): Bibliography**

- ETR 176 (1995): "Terminal Equipment (TE); The interworking and interoperability of retrieval services and audio-visual services on narrow band networks".
- ETR 272 (1996): "Terminal equipment (TE); Audio-visual retrieval services on narrowband networks; Priority setting and description".

## History

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